Index to Vol. IV—January-December, 1932 Heating, Piping and Air Conditioning

Air Conditioning—General

Air Conditioning Is Saving Industry $15,000,000 Yearly, by Willis H. Carrier.
No. 12. *December*, 1932. *p.* 785.
Climate's effect on man; industrial development of air conditioning; two types; air conditioning ups production, downs cost; saving in cigar plant; estimated saving to industry; economic aspect of industrial air conditioning; future of comfort conditioning; why humans need conditioned air; research; theater system pays first summer; pays in stores; office buildings save; railroads; homes; development of tropics; what air conditioning means to business and employment. 10 i.

Lay-Out of a Zoned Air Conditioning System, by Ralph E. Phillips and Donald T. Robbins.
No. 1. *January*, 1932. *p.* 12.
Los Angeles Stock Exchange building; exposures and nature of occupancy make zoning necessary; conditions maintained; location of equipment; control and recirculation; boilers are oil-fired; heating system two-pipe vacuum return down-feed; amount of air; cost of power; cost of installation, diagram of chilled water and condensing water piping. 9 i.

Conditioning System Planned to Enable Operating Economies, by Chester L. Nelson.
No. 3. *March*, 1932. *p.* 171.
Air conditioning equipment in New York Curb Exchange building; new section added; sources of heat; conditions maintained; trading floor equipment; air filtered and ionized; instruments; conditioning the clearing house; refrigeration and water piping; cold water storage tank cuts cost of refrigeration; interchanger; air for pneumatic tube system dehumidified. 5 i.

20-Story Building Humidified in Winter, Cooled in Summer, by H. D. Nock.
No. 10. *October*, 1932. *p.* 675.
Mutual Home Building, Dayton, Ohio, air conditioned; contains banking and office space; the building; 56-F water from deep well used; district steam; reasons for air conditioning; ducts; two-speed motors drive fans; temperature and humidity control; location of equipment; thermostat controls damper; each exposure separately controlled; central riser chamber for piping and ducts; space between joists for branch ducts; outlet cabinet at each window; control of cold water; cost of winter and summer operation. 4 i.

Air Conditioning Needs of Hospitals Specified, by Dr. C. A. Mills.
No. 4. *April*, 1932. *p.* 275.
Needs for air conditioning in hospitals described and listed.

Shanghai Has Air Conditioned Building, by Cyril L. Tilburn.
No. 2. *February*, 1932. *p.* 120.
Mechanical equipment of Sassoon House, Shanghai, China; forced hot water heating system; domestic hot water; the boiler plant; refrigeration plant; air conditioning. 6 i.

Improved Inverted-Refrigeration Cycle for Summer-and-Winter Air Conditioning, by H. J. Stoever.
No. 6. *June*, 1932. *p.* 412.
Operation of a Carnot-cycle plant; performance measured by coefficient; performance of actual plant differs from ideal; cycle which improves ideal coefficient; its coefficient of performance; theoretical result obtained with vapor cycle; method of approximating cycle; approach to cycle uses several condensers; air-conditioning engineers should recognize that cycle operating between two fixed temperatures is not the ideal. 9 i.

Reversed Refrigeration Cycle Heats Office Building.
No. 6. *June*, 1932. *p.* 415.
Brief description of reversed-refrigeration cycle for heating office building of Southern California Edison Co., Los Angeles. 1 i.

Knowledge of Electrical Fundamentals Saves Costly Mistakes, by Milton K. Arenberg.
No. 3. *March*, 1932. *p.* 199.
Specifying the motor; direct current; alternating current; phase; types of alternating current motors; miscellaneous points to remember. 3 i.

Attention to Maintenance of Motors Saves Money.
No. 10. *October*, 1932. *p.* 664.
Motors need attention; causes of losses in motors; motors driving centrifugal pumps and fans; protective devices; speed-reducing transmissions; ammeter readings and shifting motors keep power cost down; illustrations show uses of various types of motors. 10 i.

Determining Air Velocity with High-Temperature Kata, by T. C. Angus.
No. 5. *May*, 1932. *p.* 394.
Determination of effective temperature thermal index requires air velocity to be found at point under consideration; new kata thermometer for use in industrial buildings having high air temperatures; formula for air velocity; chart gives result graphically. 1 i.

Interest in Air Conditioning Is World-Wide.
No. 8. *August*, 1932. *p.* 556.
Letters from South Africa and Brazil requesting information on air conditioning for human comfort.

Modernize Heating, Piping and Air Conditioning Systems for Efficiency and Economy—the Air-Conditioning System.
No. 11. *November*, 1932. *p.* 737.
Check-list and maintenance guide for air-conditioning systems.

Air Conditioning—Cleaning

A Review of Dust, by L. B. Spafford.
No. 1. *January*, 1932. *p.* 33.
Why and what the engineer should know about dust; what dust is; where it is; useful and objectionable dusts. 1 i.

Size and Characteristics of Air-Borne Impurities, by W. G. Frank.
No. 1. *January*, 1932. *p.* 35.
Origin of dust suspensions; measuring dust particles; surface mean diameter; volume mean diameter; dust chart classifies laws of settling, etc.; laws of settling; Brownian movement; permanent and temporary impurities; fumes; smoke; explosive dust suspensions; fighting atmospheric pollution; bibliography. 2 i.

Air Conditioning Detroit Edison Research Building, by J. N. Livermore and P. S. Hosman.
No. 9. *September*, 1932. *p.* 593.
Necessity for air conditioning; clean air prime requisite; refrigeration; determining maximum cooling load; reduce cooling load by venting roof; roof construction; ventilators; central cooling system with zoned ducts; compressor and motor; cold water tank carefully insulated; how one pump does work of two; keeps slugs of ammonia from suction line; refrigeration plant also used for testing work; control equipment centralized. 8 i.

Air Conditioning—Cooling

Cost of Cooling an Office Building.
No. 2. *February*, 1932. *p.* 109.
(Abstracted from paper by S. R. Lewis presented at meeting of *Western Society of Engineers*); 40-story office building analyzed; cost per sq. ft. of heating system, ventilating system, and cooling system.

Office Conditioned Economically With Unit Coolers, by Clifford F. Holske.
No. 2. *February*, 1932. *p.* 98.
Ice-cooled air conditioning system installed in offices of Knickerbocker Ice Co., Freeport, N. Y.; cost of installation and operation; conditions maintained; water cooling tank; the unit coolers; fans. 2 i.

Water Coolers for Air-Conditioning Systems Using Ice, by Clifford F. Holske.
No. 6. *June*, 1932. *p.* 405.
Figuring size and capacity of ice bunker; construction; typical methods of construction; water piping; control of water temperature; overflow. 4 i.

Small Theater Solves Air-Conditioning Problem With Ice.
No. 5. *May*, 1932. *p.* 353.
Layout of ice-cooled air-conditioning system in a small movie theater; control of water; cooling chamber; capacity of plant; automatic control; diagram of equipment. 2 i.

"Twenty Degrees Colder Inside," by E. Roger Hewitt.
No. 9. *September*, 1932. *p.* 630.
Tables aid in maintaining proper air conditions in theaters; use of the tables.

Keeps Patrons Cool With Ice, by Clifford F. Holske.
No. 8. *August*, 1932. *p.* 538.
Occidental Hotel, Washington, D. C., installs air-condiioning system for dining rooms; equipment; ducts installed without interruption to operation; cold water controlled by electrically-operated valve; typical amounts of ice delivered; water piping; cooling load; tests show results; management well-pleased. 5 i.

Compressors for Air Cooling Located in Elevator Pits, by F. F. Sengstock.
No. 2. *February*, 1932. *p.* 100.
Air cooling system installed for restaurant in Merchandise Mart, Chicago; size of restaurant; the carbon-dioxide compressors and the motors; lay-out of refrigeration equipment in elevator pits; direct expansion coils in ducts; pipe joints welded. 6 i.

Installs Cooling System June 1; Summer's Business Increases 60%.
No. 11. *November*, 1932. *p.* 734.
Steam ejector air-cooling system in Maurice's restaurant, Chicago; reasons for air conditioning; operation; cooling restaurants; conditions maintained; thermostat; steam, water and power required. 2 i.

Does Cooling Pay?
No. 9. *September*, 1932. *p.* 651.
Chart shows relation between business done in air-conditioned Chicago restaurant and outside dry-bulb temperature; two curves very similar. 1 i.

Car Conditioning Developing Rapidly.
No. 4. *April*, 1932. *p.* 261.
Importance of railway car air conditioning and its possibilities; history of passenger car heating and ventilating; methods of heating; heating cars in yards and in motion; pre-cooling; cooling with ice; early experiments; factors to consider; the various systems described and diagrammed. 11 i.

Pre-Cooling Fruits and Vegetables With Circulating Air, by Clarence E. Baker.
No. 1. *January*, 1932. *p.* 42.
Importance of pre-cooling; its value; heat generated by fruits; methods of pre-cooling; bibliography. 2 i.

Air Conditioning—Humidifying and Dehumidifying (Including Drying)

Benefits—Not Cost—Decided This Complete Air-Conditioning Plant, by E. L. Ellingwood.
No. 8. *August*, 1932. *p.* 550.
Air conditioning system in Times-Mirror Printing and Binding House, Los Angeles, Calif.; reasons; entire building conditioned; constant dew-point maintained; control; the equipment; soundproof fan and motor platform detail. 3 i.

Newspaper Plant Air Conditioned for Efficient Production, by Joseph A. Osborn.
No. 1. *January*, 1932. *p.* 40.
Press-room in new building of St. Louis Globe-Democrat humidified; radiation; use of condensate for building hot water supply conserves heat; district steam used; individual exhaust systems. 5 i.

A Method of Conditioning Paper, by John A. Masek.
No. 7. *July*, 1932. *p.* 491.
(On the Job); paper web conditioner in newspaper press-room vaporizes water with compressed air; water vaporized; installation; advantages. 2 i.

Effect of Relative Humidity on Cellophane.
No. 7. *July*, 1932. *p.* 486.
Two types; storage of Cellophane; relative humidities in cigar plant using Cellophane for wrapping.

Drying—An Essential Process in Industry, by Walter L. Fleisher.
No. 11. *November*, 1932. *p.* 719.
Thermodynamics of leather drying; air lost by leakage; methods of drying leather; the time element; typical example worked out; conditions should be automatically controlled.

Drying Method Is All-Important, by Malcolm Tomlinson.
No. 2. *February*, 1932. *p.* 116.
Unit effect of humidity, pressure and temperature shown by charts; use of charts in solving drying problems; four general drying methods; drying with air; importance of proper method; drying lumber offers opportunities for economy; physical structure of product influences the drying method. 11 i.

Calculations for Drying, by Malcolm Tomlinson.
No. 4. *April*, 1932. *p.* 276.
Method of computing heat required; specific heat of various materials; calculations for drying a typical electrical product; product must be sealed against moisture regain; harmful effect of temperature depends upon time; three-stage drying of beets (detailed calculations); charts for high-temperature drying; low-humidity psychrometric charts; Grosvenor psychrometric chart. 7 i.

Removal of Moisture From Precipitates—Drying Zinc Stearate, by Malcolm Tomlinson.
No. 5. *May*, 1932. *p.* 393.
Fundamenals of removing moisture from chemical precipitates; selecting the drying method; example for zinc stearate.

Economy in Drying Aided by Vapor Proofing, by Malcolm Tomlinson.
No. 7. *July*, 1932. *p.* 482.
Need for barring moisture flow through walls of low-humidity rooms; moisture equilibrium; vapor pressure; wall construction; typical case; method of vapor proofing.

Prevents Damaged Goods, Rusty Machinery, by Ralph Winslow.
No. 8. *August*, 1932. *p.* 543.
Roof insulation stops condensation and drip; chart makes easy figuring; need for such prevention; roof insulation of textile mill; paper plant prevents spoilage; chart shows economical thickness of corkboard; roof resistance table. 2 i.

Uses Pipe Caps in Repairing Air Washer, by Lawrence H. Georger.
No. 11. *November*, 1932. *p.* 745.
(On the Job); pipe caps installed in air washer prevent spray back lash; method of using. 1 i.

Air Conditioning—Ventilating

Preventing Air Pollution in the Plant, by John H. Ruckman.
No. 5. *May*, 1932. *p.* 356.
Numerous substances and materials tend to pollute the air in plants; use of such materials increasing; chronic pollution; supplying fresh air to working stations; use of hoods; importance of proper air circulation; use of partition; dusts and fog; classification of objectionable materials. 7 i.

Low-Cost Protection of Fur Storage Vault, by Milton K. Arenberg.
No. 5. *May*, 1932. *p.* 338.
Carbon tetrachloride used as fumigant in fur vault, Boston Store, Chicago; the vault; handling the furs; ventilating equipment; introducing the fumigant; operating costs and results. 2 i.

Ventilating System Designed for Efficient Operation, by George W. Ott.
No. 7. *July*, 1932. *p.* 487.
New Chicago postoffice built over railroad tracks; removing locomotive smoke; smoke trough over tracks; lobby air circulated through booster heaters; air may be exhausted at floor or ceiling to promote comfort; 1,500 tons of ducts; heater stacks pneumatically controlled; fans have 6 per cent excess capacity for leakage; induction motors drive fans with V-belts; complete system of temperature control. 3 i.

Estimating Duct Work for Louisiana State Capitol Building Air-Conditioning System.
No. 6. *June*, 1932. *p.* 418.
Schedules worked out for sheets; estimating sheet metal required; schedules for angles, inserts, hanging and bracing; conditioning system described briefly. 1 i.

Heating, Piping and Ventilating Where Requirements Are Severe, by Junius D. Edwards.
No. 7. *July*, 1932. *p.* 479.
Aluminum Research Laboratories, New Kensington, Pa.; ventilation major problem; fans and motors on roof; baffle plate in hood distributes suction; heat conserved by drawing air through hoods from building; metal-covered pipe chases on outside walls; drain pipes arranged for easy cleaning; distilled water in aluminum piping; vapor-vacuum heating system; aluminum paint on piping. 4 i.

Chart Helps Duct Changes, by George T. Condron.
No. 8. *August*, 1932. *p.* 555.
(On the Job); chart for low-pressure air flow in ducts based on quantity of air flowing; shows loss of head, air flowing and dimensions of circular or rectangular ducts; use of chart; basis of chart. 1 i.

"Open For Discussion."
No. 1. *January*, 1932. *p.* 84.
Comments by S. R. Lewis and A. C. Willard on "Turning Blades Reduce Duct Elbow Losses," by F. E. Wertheim (November, 1931, issue); closure by F. E. Wertheim; comparison of Loring Wirt and B. L. Spivak formulas; efficient and inefficient elbows. 6 i.

The Control of Motors Driving Ventilating Fans, by Samuel R. Lewis.
No. 12. *December*, 1932. *p.* 794.
Energy requirements of fans; motors must have excess capacity for some types; tendency to locate fans near areas served requires remote control arrangements; operations which must be controlled; starting equipment; controlling unit ventilators in office building; diagrams for various control arrangements. 3 i.

Choosing a Multi-V Drive for a Fan.
No. 9. *September*, 1932. *p.* 615.
Information needed; five belt cross-sections; number of belts; load characteristics; sheave diameters; arc of contact; typical fan drive selected from manufacturer's literature. 2 i.

Spot Welding Stainless Steel Sheets, by V. W. Whitmer.
No. 10. *October*, 1932. *p.* 669.
(On the Job); stainless steels well adapted to spot welding; pressure has effect on weld; the welding procedure; reducing depression in sheet; oxide formed is surface condition.

Air Velocity and Acoustics, by E. F. Ries.
No. 1. *January*, 1932. *p.* 89.
Comments on effect of humidity and velocity of air on acoustics; lining ducts. 1 i.

Total, Static and Velocity Pressure, by A. A. Berestneff.
No. 3. *March*, 1932. *p.* 195.
Definitions of total, static and velocity pressure; misconceptions sometimes made; various cases illustrated; references analyzed; conclusions. 6 i.

Determining Total, Static and Velocity Pressure, by L. A. Harding.
No. 4. *April*, 1932. *p.* 324.
("Open for Discussion"); comments on "Total Static and Velocity Pressure," by A. A. Berestneff, March, 1932, issue; definitions of the terms; case of fan connected to inlet and outlet ducts considered; pressures shown by diagram. 1 i.

Heating—General

Heating the Tall Building, by Joseph W. Degen.
No. 9. *September*, 1932. *p.* 602.
Effects of chimney action in tall buildings on the heating; studies made in the Equitable Building, New York City; data on radiation; draft-gage readings show pressures on various floors; pressure difference used for ventilation; radiator count shows effect of chimney action; north exposure had no effect on number of radiators turned on. 10 i.

Heating-Up Load for Buildings Heated Intermittently, by John M. Robertson.
No. 5. *May*, 1932. *p.* 341.
Importance of load on heating plant due heat for warming the building construction; churches present severe problem; determine rate at which building materials absorb heat; typical curves; 4 F per hr. average temperature rise assumed; load varies with type of construction; heating-up load for a field house; no relation between heat loss and heating-up load; graphic comparisons of heat loss and heating-up load for four buildings. 5 i.

Heating-Up Load for Buildings Heated Intermittently, by E. K. Campbell.
No. 6. *June*, 1932. *p.* 420.
(Open for Discussion); comments on article in May, 1932, issue; two elements involved; article contains "experience" data.

Modernize Heating, Piping and Air Conditioning Systems for Efficiency and Economy—Plant and Building Heating Systems.
No. 12. *December*, 1932. *p.* 797.
Check-list and maintenance guide for steam, vacuum, vapor, hot-water and warm-air heating systems and buildings served by district steam.

Changing the Nomenclature of Heating Engineering, by B. S. Harrison.
No. 3. *March*, 1932. *p.* 251.
Comments on heating nomenclature.

Heated and Ventilated Poultry Houses Have Many Advantages, by Frederic L. Campbell.
No. 3. *March*, 1932. *p.* 204.
Advantages of properly heated and ventilated poultry houses; proper conditions to maintain. 1 i.

Heating—District and Central (Including Underground Steam Piping)

Mile-Long Underground Line Supplies Steam for Process, by Robert L. Fitzgerald.
No. 3. *March*, 1932. *p.* 180.
Steam supplied Eli Lilly Company from Indianapolis Power & Light Co.; amount; condition of steam; factors affecting size of line; construction details; depth; location; insulation; cross-section of tile conduit; factors affecting insulation; covering used; conduit; pipe; expansion; line will act as surge tank. 4 i. (Also see May and June, 1932, issues.)

Underground High-Pressure Steam Piping, by J. E. Hillemeyer.
No. 5. May, 1932. p. 354.
(Open for Discussion); comments on article "Mile-Long Underground Line Supplies Steam for Process," March, 1932, issue; location of vitrified tile block; insulating rollers shows appreciable saving; placing high-pressure traps in separate manholes; place reducer past turn. 1 i.

Heat Loss From Underground Steam Lines Tested.
No. 11. November, 1932. p. 730.
Thirteen miles of new underground mains tested for heat loss; results.

Steam Consumption of Buildings.
No. 9. September, 1932. p. 631.
Tables showing average steam consumption of various types of buildings in Indianapolis, Ind., using central station steam; cost in cents per sq. ft. radiation.

Heating—Steam, Vacuum, Vapor, Hot Water

Selecting the Right Size Heating Boiler, by Sabin Crocker.
No. 2. February, 1932. p. 103.
Selection of right size boiler depends on at least eight items; absorbing capacity of boiler surface; manufacturers' ratings; computation of load due to connected radiation; bare and covered piping; domestic hot water requirements; tables and curves for heat emission and condensation factors for radiation, variation with pipe size of rate of heat transfer through 85 per cent magnesia and bare pipe, heat emission through horizontal bare iron and steel pipe, piping "tax" for several buildings, water heating loads, and heating power of brass and iron pipe coils in water storage tanks. 4 i.

Selecting the Right Size Heating Boiler, by Sabin Crocker.
No. 3. March, 1932. p. 186.
Satisfactory warming-up period and its importance; warming-up allowance; general rule; computing time required for warming up a system; typical weights of boilers and water content, pipe, screwed and flanged fittings, radiators; time required for warming-up period for one-pipe steam system and two-pipe gravity hot water system computed in detail; solution of problem by formula and chart; use of performance curves recommended; typical curves. 3 i.

Selecting the Right Size Heating Boiler, by Sabin Crocker.
No. 4. April, 1932. p. 267.
Fuel-burning and its importance; practical combustion rates; hand-fired boilers; stoker-fired boilers; setting heights; oil-fired boilers; gas-fired boilers; comparison of two gas-fired jobs. 5 i.

Clean Boilers Save Fuel, by G. L. Davis.
No. 9. September, 1932. p. 620.
(On the Job); clean boiler heating surfaces necessary to heating plant economy; how soot cuts heat transfer shown pictorially; test run on boiler before and after cleaning tubes; results shown graphically; fuel saved. 2 i.

Soot Blower Makes a 14½% Fuel Saving, by G. L. Davis.
No. 4. April, 1932. p. 274.
Saving made by Belcrest Hotel, Detroit, by installating air-operated mechanical soot blower; operation. 2 i.

Zone Control of Radio City Heating System, by W. Walter Timmis.
No. 5. May, 1932. p. 335.
General features of Rockefeller Center, New York City; the center tower building; method of zoning the vacuum-heating system; control; orifices insure proper circulation of steam. 5 i.

Piping Changes Made Without Harm to Service, by Samuel R. Lewis.
No. 2. February, 1932. p. 111.
How the heating plant in an office building was rejuvenated without shutting system down; two-pipe vacuum system installed; heating the building during the changes; elevations and plans of piping and traps, with new radiators and unit ventilating machines. 3 i.

Promoting Operating Economy in School Plants, by John Howatt.
No. 1. January, 1932. p. 1.
Economies must not impair service; design; ten-year fuel consumption records for Chicago public schools; the boiler load; typical daily load curve; seasonal fuel consumption; types of boilers used; fuel cost; furnace maintenance cost; cooling-off rate of building; shades; weatherstripping; instructions for operating engineers. 6 i.

Trouble-Shooting a Noisy Heating Job, by William Goodman.
No. 10. October, 1932. p. 680.
Concealed radiator supply branches in apartment building trapped; locating the trouble without tearing out walls; correcting the trouble; cause of the trouble. 5 i.

Modernized Department Store Heating System Cuts Cost.
No. 6. June, 1932. p. 460.
(On the Job); Hutzler Brothers' department store, Baltimore, Md.; 5,000,000 cu. ft. heated by gravity steam-heating system; control; operating procedure; divided into 7 zones; steam consumption, heating load, operating rate, etc., tabulated. 1 i.

Saves 18% on Heating Cost, by H. G. Thomas.
No. 11. November, 1932. p. 744.
(On the Job); how a check-up was made of a vacuum-heating system; saving made.

Locating "Vacuum Pump" Troubles, by John A. Masek.
No. 5. May, 1932. p. 350.
Apparent pump troubles often caused by piping or specialties at fault; air leakage; radiator traps and valves; re-evaporation of condensate; pumping condensate; lift fittings; elimination of water in discharge line; boiler compounds; cutting out the pump; proper placing of check valves; float mechanism of pump; vent or overflow pipe over motor; typical vacuum pump service calls; suction lift curves for hot water. 4 i.

Economies With Vacuum Pumps, by George T. Condron.
No. 7. July, 1932. p. 492.
(On the Job); possible economies from installing vacuum pump on steam-heating system return; evaluating the expected saving.

New Postoffice a Great Industrial Work-Space—Heated by Steam and Hot Water, by George W. Ott.
No. 6. June, 1932. p. 401.
Description of Chicago, Ill., postoffice building; handling the mail; steam purchased; radiation; hot-water converters and pumps; unit heaters in trucking space; condensate preheats domestic water; economizer; pipe materials and connections; piping runs exposed; pressure-reducing valves; sound isolation of equipment; pipe insulation. 2 i.

Cuts Heating and Compressed-Air Cost With Waste-Heat Boilers, by Thomas R. Shaver.
No. 11. November, 1932. p. 728.
Use of waste-heat boilers; installation in Belle City Malleable Iron Co. plant, Racine, Wis.; steam from waste-heat boilers drives air compressors; exhaust steam heats water circulating through pipe coils; one boiler direct fired at night; water circulating pump turbine driven; the piping. 6 i.

Saves Fuel by Equalizing Flow in Hot-Water Heating Systems, by Erwin L. Weber.
No. 9. September, 1932. p. 608.
Gravity circulation systems tend to equalize; forced systems do not; example shows annual loss of $1.35 per radiator on unbalanced system; economics of equalization; thermocouples determine temperature drop through radiators; method of equalizing water flow. 1 i.

Electric Control of Motor-Driven Pumps, by Samuel R. Lewis.
No. 11. November, 1932. p. 713.
Control of pump motors in an office building; heating-system vacuum pumps; boiler-feed pump; sump pumps; 40-hp. motors have starters of compensator type; controls for synchronous motors; manual switches for circulating pumps; control of the fire-pump motor; points to observe in connection with motor protective devices. 4 i.

What the Hartford Loop Is and What It Does, by Robert E. Hattis.
No. 7. July, 1932. p. 483.
What the loop is; what it does; how it prevents low water in boiler; its use with boilers in parallel; typical installations on cast-iron and steel boilers. 9 i.

Rolling, Turning of Pipe Being Welded; How It's Prevented, by William L. Hand.
No. 8. August, 1932. p. 541.
New Field office building, Chicago, an all-welded job; causes of rolling and turning; how contractor prevented it; welding procedure; piping must keep pace with building; ¾-in. connections welded; caring for expansion; radiator branches and connections of copper. 1 i.

Stops Scale From Clogging Radiator, by W. H. Wilson.
No. 8. August, 1932. p. 552.
(On the Job); radiator return connections which aid in cleaning out scale or prevent stoppage. 1 i.

How to Paint Hot Surfaces, by Herbert Chase.
No. 8. August, 1932. p. 553.
(On the Job); cleaning galvanized surfaces; primer promotes adhesion; effect of paint on heat emission.

Heating—Warm Air and Electric

Utilizing Waste Gases for Factory Heating, by H. C. Weller.
No. 7. July, 1932. p. 474.
Gem Clay Forming Co., Sebring, Ohio, uses waste gases from continuous pottery kiln for factory heating and drying; saving in heating cost is $7,500 annually; kiln fired with natural gas; gas consumption; principles involved; determining available heat in flue gases; comfort and health in plants heated with waste gases; duct system; loss of head in ducts. 6 i.

Selecting Direct-Fired Gas Heaters, by Platte Overton.
No. 3. March, 1932. p. 176.
Gas unit (fired with natural gas) heats factory offices; data sheet and floor plans; inlet temperature and air supplied; provisions for cooling with tap water; method of selecting the capacity of the heater; determining inlet temperature; sizing ducts to resistance (table); gas units heat factory space. 2 i.

Heats School With Two Oil-Fired Furnaces, by John Howatt.
No. 11. November, 1932. p. 724.
Warm-air heating plant in 8-room Bret Harte school, Chicago; calculating heating load; the furnaces; reducing heat loss through ceiling; humidification; temperature regulation; stratification in ducts; test run; results; fuel oil consumption; zoning control. 4 i.

Heating a Garage Economically, by Samuel R. Lewis.
No. 1. January, 1932. p. 20.
Method of heating a two-car apartment-house garage; duct from boiler room; unit heater; heat transfer device below boiler water-line; introducing air for combustion to a boiler room. 3 i.

Auxiliary Electric Heating With Off-Peak Power a Method of Cutting Cost, by Lee P. Hynes.
No. 10. October, 1932. p. 658.
Off-peak power at low rates used for auxiliary space heating in plants and buildings; opportunities; methods; supplying hot process water; economics of proposition; typical applications. 6 i.

Piping—General

Leak-Tight Joints—600 to 550,000 Lb., by F. E. Wertheim.
No. 7. July, 1932. p. 469.
Types of high-pressure pipe joints which have successfully met service requirements; air-tight joints for 2,000-lb.; water-tight joints under 1,750-ft. head; gas-tight joints at 800 lb. (couplings; split-housing flexible joints); steam-tight joints—600-lb. W. S. P. to 3,300-lb. (Loeffler joint; weld-seal joint; Benson joint); standards for 1,500-lb. W. S. P. weld-seal joints; spherical-seat joints.

Leak-Tight Joints—600 to 550,000 Lb., by F. E. Wertheim.
No. 8. August, 1932. p. 546.
A. S. A. tongue-and-groove joints; ring joints; wedge-ring joint; Dr. Percy W. Bridgman's leak-tight joint at 550,000 lb. per sq. in.; "unsupported area" principle; union for small-size high-pressure tubing; joint for large diameter apparatus; conclusions; bibliography. 10 i.

Flow Meters, by Louis Gess.
No. 12. December, 1932. p. 792.
Use of flow meters increasing; avoid expensive changes in piping to permit accurate metering; fittings affect accuracy; straightening vanes; measuring discharge from boilers; location of manometer; measuring flow of steam and liquids; measuring flow of gas; measuring pulsating flow. 4 i.

Using Pipes As Beams, by M. Barry Watson.
No. 10. *October*, 1932. *p.* 667.
(On the Job); chart simplifies picking proper size of pipe for use as beam for supporting tanks, etc.; use bearing surface to apply load; using chart to solve typical problem; getting a boiler across a gap on pipe supports. 2 i.

Using Pipe for Columns, by M. Barry Watson.
No. 12. *December*, 1932. *p.* 806.
(On the Job); chart enables selection of right size pipe for use as compression members in supporting tanks, heaters, etc.; how chart is used. 1 i.

Apply Pipe Wrench Properly, by John J. Harman.
No. 9. *September*, 1932. *p.* 618.
(On the Job); proper application of wrench prevents damage to pipe; direction and magnitude of forces; high crushing position should be avoided; application of wrench to alloy cast-iron pipe; don't use over-size wrench; schedule of proper sizes. 2 i.

Several Piping Tools I've Found Handy, by W. H. Wilson.
No. 12. *December*, 1932. *p.* 808.
(On the Job); several wrenches of particular value in piping maintenance and installation; screw jack; pinch bar; wedge; scraper. 1 i.

Don't Forget Safety in Piping!, by W. H. Wilson.
No. 9. *September*, 1932. *p.* 621.
(On the Job); safety is important in industrial piping; compressed air used for removing heavy hydraulic ram; water pressure safer; other unsafe practices and remedies; provide tapped opening in steam valve body to relieve pressure. 2 i.

Properly-Located Shut-Off Valves Aid Maintenance, by W. H. Wilson.
No. 1. *January*, 1932. *p.* 86.
(Practical Piping Problems); need for proper shut-off valves; location depends on conditions; fire-protection piping changed; shut-off valve in steam header; pump suction line; drain tappings on gate valves. 7 i.

Center-to-Face Dimensions for Ferrous Flanged Valves.
No. 3. *March*, 1932. *p.* 179.
Center-to-face dimensions for ferrous flanged valves approved by *Manufacturers' Standardization Society of the Valve and Fittings Industry*; tentative proposal being distributed for criticism.

Organizing for Industrial Piping Installations.
No. 5. *May*, 1932. *p.* 396.
(On the Job); modern production methods applied to installing industrial welded piping; chart shows flow of authority and of materials; bill of materials; line list; method simplifies cost keeping. 2 i.

Portable Hoists Aid Installation, by L. B. Murdock.
No. 11. *November*, 1932. *p.* 742.
(On the Job); use of portable lifters in the installation and maintenance of piping, heating and air conditioning equipment; types used. 3 i.

Templet Aids in Detailing Piping, by Clinton C. Hubbell.
No. 2. *February*, 1932. *p.* 97.
Construction and use of a templet which facilitates drawing piping lay-outs. 2 i.

Pipe Support Fabricated by Welding.
No. 11. *November*, 1932. *p.* 745.
(On the Job); detail of pipe support made from channels by welding. 1 i.

Paints Indicate Approximate Temperature, by Herbert Chase.
No. 1. *January*, 1932. *p.* 86.
Use of heat sensitive paints in experimental or routine testing; composition of a paint for temperatures up to 300 F; color and temperature range; other temperature-sensitive paints.

Heat Sensitive Paint, by S. W. Rushmore.
No. 2. *February*, 1932. *p.* 122.
Uses for heat sensitive paints.

Piping—Air

Solving Vacuum Pump Problems, by S. B. Redfield.
No. 1. *January*, 1932. *p.* 24.
Selecting a vacuum pump for a system which handles sheets of paper by vacuum; test run; approximate volumetric efficiency line; effect of vacuum on amount of air flowing; formulas for flow, according to Fleigner; pump displacement; equivalent area method; flow of air through nozzles; "flow ratio"; determining air leakage into a system. 4 i.

Design and Installation of Piping for High Vacuum Pneumatic Conveyor Systems, by E. H. deConingh.
No. 1. *January*, 1932. *p.* 17.
Use of pneumatic conveying; joining piping; wear-resisting bends; fittings; conveying capacity; lay-out of piping. 7 i.

Piping Air for Pipe Organs Presents Interesting Problems, by Lester C. Smith.
No. 11. *November*, 1932. *p.* 751.
Installation described; organ blower requirements; conveying wind to organ chest; electrical control of blowers. 4 i.

Removing Moisture from Air Piping, by C. A. Dawley.
No. 3. *March*, 1932. *p.* 248.
("Open for Discussion"); removing moisture from underground air lines; diagram shows lay-out. 1 i.

Piping—Oil

Piping Steam for Heating Oil Tanks, by Samuel R. Lewis.
No. 9. *September*, 1932. *p.* 610.
Need for and advantages from heating oil tanks in plants and oil-handling stations; joints may be steam-tight, but leak oil; oil must not enter boiler; steam should be controlled; arrangement for skimming oil from water; variety of methods for heating tanks shown by investigation; several typical arrangements commented on and shown; oil as heat-carrying medium; steam pressures used; volume of "1,000 gal. of oil at 60 F" at various temperatures. 8 i.

Unloading Oil from Tank Cars, by W. H. Wilson.
No. 2. *February*, 1932. *p.* 169.
(Practical Piping Problems); unloading an oil car with a defective valve; a steam heater for an oil car unloading nozzle. 2 i.

Use of the Proper Piping Material Important, by W. H. Wilson.
No. 6. *June*, 1932. *p.* 462.
(On the Job); illustrations of three valve discs removed from fuel-oil line show need for using the proper material. 1 i.

Water Seal Protects Valve Diaphragm, by W. H. Wilson.
No. 11. *November*, 1932. *p.* 743.
(On the Job); water seal protects composition steam valve diaphragm which is controlled by fuel-oil pressure; installation and layout; injurious effect of oil on diaphragms. 2 i.

Piping—Process Liquids

Problems in Piping Chemicals Typified by Acetic Acid, by D. F. Othmer.
No. 5. *May*, 1932. *p.* 346.
Methods of acetic acid production; use is wide; piping material must be carefully chosen; acetic acid inflammable when anhydrous; use of wooden pipe; rubber hose and pipe has applications; metallic piping materials (copper, silver, high-silicon cast iron, stainless steels, lead, aluminum, tantalum); electroplating tantalum. 4 i.

Acid Piping System Saves Handling Costs, by Dwight Spofford.
No. 2. *February*, 1932. *p.* 110.
Piping layout for handling sulphuric and hydrochloric acid at plant of Electro-Chemical Engraving Co., New York City; pipe tunnel; storage tanks; pumps; operation. 2 i.

Choose Motor to Meet Conditions, by Francis A. Westbrook.
No. 11. *November*, 1932. *p.* 740.
Totally-enclosed fan-cooled motor first drives fan handling acid fumes, then shifted to electrolytic pump; service constant; "breathing"; pick motor to meet local conditions. 1 i.

Piping—Refrigeration

Piping Problems of the Bakery—Refrigeration Piping, by Arthur W. Archer.
No. 6. *June*, 1932. *p.* 407.
Bakeries largely mechanized; a typical plant; uses of refrigeration in bakery; direct-expansion system; brine for severe climates; refrigeration equipment; pipe shaft; provisions for cleaning; mixing room cooling and heating; baudelot tank in storage room; yeast storage box; cooling tank construction; tank for mixer jacket water; cold air for mixer bowls; cooling tower; pipe and fittings; insulation; allowing for expansion; air bunker; piping details. 6 i.

Refrigerating System Cools Air and Water, Condenses Alcohol, Freezes Waxes, Makes Ice, Etc., by Terry Mitchell.
No. 3. *March*, 1932. *p.* 184.
Description of refrigerating and air conditioning equipment in Philadelphia plant of Sharp & Dohme, manufacturers of pharmaceutical and biological products; requirements of the various services; piping layout and methods of meeting them. 5 i.

Piping Layout for an Ice-Skating Rink, by E. Zuckerman.
No. 2. *February*, 1932. *p.* 113.
Indoor ice-skating rink at University of Illinois; refrigerating equipment; piping arrangement; details of header piping and slab construction; piping welded; slab is expansion floating type; provisions made for installing a brine heater. 4 i.

Changes Pipe Size, Nets 31 Per Cent on Cost, by Herman Vetter.
No. 11. *November*, 1932. *p.* 731.
Correctly-sized suction line on ammonia compressor cuts power charge; calculating volume of vapor handled; determining hp required; example shows possible saving; pressure drop in piping; vapor velocities in suction piping. 2 i.

Plants Pay for Proper Piping, Whether They Have It or Not, by R. C. Doremus.
No. 11. *November*, 1932. *p.* 733.
Proper piping design in refrigerating plants of economic importance; if lines are too small, power cost is high.

Check Refrigerating Coils, by Robert S. Wheaton.
No. 7. *July*, 1932. *p.* 490.
(On the Job); knowledge of ammonia properties essential in design of ammonia coils for cooling brine; rule-of-thumb methods dangerous; coils for a typical brine tank; types of coils for brine or ice-making tanks. 1 i.

Piping—Steam (Including Steam for Process)

Plant and Utility Exchange Steam and Power—$70,000 Saving Estimated, by William A. Hanley.
No. 5. *May*, 1932. *p.* 331.
Eli Lilly and Company, Indianapolis, Ind., supplied high-pressure steam through underground line by Indianapolis Power & Light Co.; steam and electric requirements; four plans studied; the plan adopted; reliability of electric supply; features of contract; investment and operating costs of plans for supplying process steam; typical process steam and electric requirements. 4 i.

Plant and Utility Exchange Process Steam and Power, by William A. Hanley.
No. 6. *June*, 1932. *p.* 421.
(Continued from May, 1932, issue); provision for any change from coal fuel; old boilers in plant; metering; $50,000 steam per year guaranteed; coal cost arbitration; contract effective; rate for steam; payments; billing demand; billing month; coal clause. 2 i.

Process-Steam Plants Need Carefully-Designed Piping, by E. C. Gaston.
No. 12. *December*, 1932. *p.* 779.
Steam requirements vary widely; paper mill a typical example; points influencing piping layout; design of the piping; heat available for power depends on pressure drop in piping; choosing economical size; expansion; guides, anchors, supports; drainage; reducing steam to two or more pressures; desuperheating. 4 i.

Process Steam Reduced Through Turbines Saves in Cost of Power, by Francis A. Westbrook.
No. 3. *March*, 1932. *p.* 193.
Large quantities of low-pressure steam used for process in plant of Crofut & Knapp Co. (hat makers), South Norwalk, Conn.; 165-lb. steam reduced through turbines; electric power is by-product; process steam heats water; piping layout; cost of steam; 75 per cent make-up. 3 i.

Piping a Blow-Down Which Saves $11.64 Daily, by Clyde R. Hoey, Jr.
No. 6. *June*, 1932. *p.* 416.
The system used; location of collectors; two regulating valves

for each boiler; flashed steam to feedwater heater; flow meter aids valve setting; calculation of heat saving made. 2 i.

Erecting a High-Pressure, High-Temperature Steam Line, by H. C. Schramm.
No. 9. September, 1932. *p.* 598.
14-in. line for 600-lb, 720 F steam at West Virginia Pulp and Paper Co. plant, Piedmont, W. Va.; arc welding with shielded electrodes; instructions for welding; removing mill scale; chill bands aid welding; clamp for aligning pipe; assembling the flanged joints; steel gasket welded between flanges; putting the piping in place; testing the line; putting line in service. 9 i.

Selection of Pipe Bends Simplified, by W. G. Hooper.
No. 9. October, 1932. *p.* 653.
Higher steam pressures and temperatures makes provisions for piping expansion of increased importance; flattening of the cross-section; formulas for quarter-, U-, expansion U-, and double offset expansion U-bends; assumptions; comparison with other formulas; curves and data presented simplify bend selection; cold springing; solution of typical problem; dimensions and moment of inertia of standard, extra-strong; 400-lb ASA seamless; 600-lb ASA seamless, 900-lb ASA seamless and 1500-lb ASA seamless pipe; expansion of steel pipe; recommended values for modulus of elasticity. 7 i.

Calculation of Friction Loss in a Multiple Loop Header System, by Max W. Benjamin.
No. 2. February, 1932. *p.* 91.
Factors which influence layout; main steam piping at Delray power plant illustrates problem; pressure loss through fittings; calculation of pressure loss; Fritzsche's formula; equivalent resistance of fittings, Foster's formula; drop in tee between boiler leads and header; pressure drop in pipe lines. 5 i.

Chart for Pressure Drop in Low-Pressure Steam Piping, by Julius Hulman.
No. 5. May, 1932. *p.* 343.
Chart simplifies use of formula; method; typical problems solved; correction factors for high pressures; example of use. 1 i.

Testing High-Pressure Steam Piping, by John J. Harman.
No. 4. April, 1932. *p.* 253.
Necessity for care in layout; standards for flanged joints; American standard joints, bolts and bolting material, threads, nuts, finish of flange faces; bolts for flanged joints; computing stress in flange bolts; turning moment to produce bolt stress and formula; chart for initial bolt stresses and relation between turning moments and bolt stresses; gaskets; assembly and testing of joints; order for tightening 16-bolt flange; field testing; test pressure must be in proportion to working pressure; hydrostatic test procedure; drying out of valve packing; testing will become standardized. 6 i.

Method and Charts for Determining Economical Thickness of Insulation, by Temple C. Patton.
No. 1. January, 1932. *p.* 6.
Three type cases considered; one insulation material applied to a flat surface; two insulation materials applied to a flat surface; one insulation material applied to circular piping; typical examples show use of charts; detailed development of the method; scope; summary of formulas. 5 i.

Formulas for Economical Thickness of Insulation Corrected, by Temple C. Patton.
No. 3. March, 1932. *p.* 248.
Typographical errors in "Method and Charts for Determining Economical Thickness of Insulation" (January, 1932, issue) corrected by author.

Note on the Insulation of Piping, by A. F. Dufton.
No. 5. May, 1932. *p.* 355.
(Open for Discussion); two charts facilitate method of choosing proper thickness of insulation described by Temple C. Patton in January, 1932, issue. 2 i.

Asbestos Cloth Products Insulation on Piping Near Boilers, by William J. Deckman.
No. 3. March, 1932. *p.* 201.
Use of asbestos cloth blankets for protecting insulation on water wall circulating tubes at Deepwater power plant; how the blankets are made and installed. 1 i.

Limited Space, Water-Logging Complicate Steam-Coil Installation, by G. W. Hauck.
No. 11. November, 1932. *p.* 717.
Steam coil in process tank in chemical plant; assembly; three coils staggered to increase heating effectiveness; details of inlets and outlets; trapping. 4 i.

Utilizing Heat of Condensate in Pipe Coils, by W. H. Wilson.
No. 4. April, 1932. *p.* 326.
(Practical Piping Problems); method of arranging pipe coils for utilizing heat in the condensate for space heating; need of care in draining pipe coils illustrated by an example. 2 i.

Solving a Temperature Control Problem, by E. D. Rogers.
No. 7. July, 1932. *p.* 472.
Instantaneous water heater in plant draws steam from turbine; vacuum in heater caused heavy load to be thrown on turbine; bypass around temperature regulator kills vacuum. 1 i.

Steam from Seed Cooker Heats Water, by J. Gordon Fletcher.
No. 11. November, 1932. *p.* 744.
(On the Job); steam used in four linseed cookers used for heating washroom water in plant; indirect water heater used; layout. 1 i.

Trapping Saves Fuel, by T. H. Rea.
No. 1. January, 1932. *p.* 30.
Closed gravity return systems; use of separating traps; trapping saves fuel for a greenhouse; possible arrangements of traps with such systems. 5 i.

Operating Industrial Steam Piping, by W. H. Wilson.
No. 3. March, 1932. *p.* 249.
(Practical Piping Problems); proper operation reduces maintenance work; turning steam on fast eliminated water hammer in one line; changing from exhaust to high pressure steam caused trouble in another system; reservoir in steam main cares for condensation. 3 i.

Operating Steam Mains, by W. H. Wilson.
No. 5. May, 1932. *p.* 395.
(On the Job); factors which influence successful operation of steam piping; operating troubles and how they were corrected; steam supply failed to maintain required pressure; fitting broken by water of condensation; 1 i.

Change in Steam-Main Drain Prevents Trouble, by W. H. Wilson.
No. 8. August, 1932. *p.* 552.
(On the Job); water hammer occurred in steam main; drainage connection changed to remedy difficulty; draining steam mains. 2 i.

Stopping Vibration of a Steam Line, by Bernard Kramer.
No. 12. December, 1932. *p.* 807.
(On the Job); steam line to reciprocating engine vibrated; how layout was changed to stop trouble; water-leg for moisture separation. 1 i.

Installing Globe and Angle Valves, by W. H. Wilson.
No. 6. June, 1932. *p.* 459.
(On the Job); opinions differ as regards position of valve disc in relation to direction of steam flow; several experiences which indicate proper method. 4 i.

Industrial Heat and Power.
No. 1. January, 1932. *p.* 39.
Communication from Wm. F. Ryan regarding the use of steam for process and power in industrial plants; should be regarded as a single problem; multiple effect evaporation may cut steam consumption.

Modernize Heating, Piping and Air Conditioning Systems for Efficiency and Economy—Steam Piping.
No. 10. October, 1932. *p.* 661.
Check-list aids in spotting steam waste; maintenance guide for steam-piping systems. See p. 741, November, 1932, for one engineer's use of this check-chart and guide.

Piping—Water and Hydraulic

Combating Corrosion of Piping, by C. E. Joos and V. A. Rohlin.
No. 8. August, 1932. *p.* 533.
Methods of stopping pipe corrosion; necessity; causes; what "pH" means; indication of a water's corrosive tendencies; controlling effect of pH explained; reducing available ionic hydrogen reduces corrosion rate; rate of displacement of hydrogen by iron from various waters; oxygen in solution; electrolytic corrosion; characteristics of water supplies; effect of temperature. 6 i.

Combating Corrosion of Piping, by C. E. Joos and V. A. Rohlin.
No. 9. September, 1932. *p.* 606.
How deaeration protects piping; types of deaerators (direct contact, flash, evaporator or surface). 1 i.

Combating Corrosion of Piping in Plants and Buildings, by C. E. Joos and V. A. Rohlin.
No. 10. October, 1932. *p.* 670.
Methods of installing deaerating heaters; supplying mains by gravity; when hot-water demand fluctuates; deaerator in basement; deaerator and storage tank in basement; deaeration of condensate returns; protecting piping in central-heating plants; protection of industrial piping. 7 i.

Saving Money in Heating Water for Use in Buildings, by L. K. Ferris.
No. 11. November, 1932. *p.* 721.
Consumption of domestic hot water; sources of heat; heat required for return water important; reducing circulating losses; data on one building show need for a study; heat supplied to water from various sources in an office building. 3 i.

Controlling a Water Heater, by E. D. Rogers.
No. 5. May, 1932. *p.* 396.
(On the Job); improper application of temperature control may give unsafe conditions; water in heater reached too high a temperature; piping layout revised. 1 i.

Cutting the Cost of Extras, by E. C. Parker.
No. 9. September, 1932. *p.* 617.
(On the Job); change made with job 80 per cent completed; water at 70 F (2 degrees plus or minus) needed for photographic room; water for air-conditioning system cools house service water in interchanger to 65 F; thermostatic mixing valve supplies 70-F water by mixing 65 F and 83 F house service; piping diagram. 1 i.

Care Needed in Valve Operation, by W. H. Wilson.
No. 7. July, 1932. *p.* 490.
(On the Job); care needed in operation; valve stem broken when valve was obstructed; how to open a stuck valve; locating trouble in water lines. 1 i.

The Sight Flow in Piping Systems, by F. E. W.
No. 6. June, 1932. *p.* 461.
(On the Job); uses of sight flow funnels; a cast aluminum funnel; a cast funnel, bronze or aluminum. 2 i.

A Simple and Practical Tank Overflow.
No. 1. January, 1932. *p.* 86.
Tank overflow arrangement giving full area of overflow pipe while functioning satisfactorily as a strainer. 1 i.

Loss in Elbows and Bends, by F. E. Giesecke.
No. 2. February, 1932. *p.* 122.
("Open for Discussion"—comments by F. E. Giesecke on "Piping Improvements Reduce Cost of Pumping" in October, 1931, issue); loss of head in elbows and bends in water piping.

Preventing Drip from Pipes, by Herbert Chase.
No. 4. April, 1932. *p.* 327.
Painting black pipe; use of granulated cork to help prevent condensation on pipes; cleaning galvanized surfaces.

Insulation of Cold-Water Lines, by T. E. Willson, Jr.
No. 6. June, 1932. *p.* 424.
Comments on "Preventing Drip from Pipes," April, 1932, issue; rule-of-thumb method for thickness will not suffice; use of molded pipe covering; author comments.

Gaskets and Packing for Hydraulic Power, by F. E. Wertheim.
No. 3. March, 1932. *p.* 202.
Advantages of hydraulic power; packing piston for hydraulic cylinder; pipe joints; red fiber; designing a copper gasket; method; soft iron gaskets; piping should be constrained to avoid whip. 4 i.

Equipment Developments

No. 4. April, 1932. *p.* 328.
Railway Air Conditioning Units; Electrodes for Welding Aluminum; High Capacity Steam Traps; Boiler Water Level Recorder; Drip Traps of Compact Design.
No. 5. May, 1932. *p.* 398.
A Circuit Breaker; Compound Dehumidified air; Combustion

Indicator-Recorder; Anti-Balancing Device for Traps; Protecting Galvanized Surfaces; Control for Hot-Water Supply.

No. 6. June, 1932. *p.* 462.

Control for Steam-Heating Systems; Valve for 125-Lb. Steam, 175-Lb. Water; New Low-Return Pump; Control for Unit Ventilators; Rotary Compressors for Air Conditioning; New Line of Water Meters; A Low-Voltage Thermostat; Cooling and Heating Units.

No. 7. July, 1932. *p.* 526.

A Plug-Type Valve; Fans for Fumes; New Conversion Units; Small Steam Traps; Room Cooler of Interest; For Pumping the Sump; Removes Oil from Steam; Solder for Aluminum; For Cooling Rooms; Potentiometer Is Self-Balancing; Controls Air Temperature; This Valve Is Cleanable; Capacitor-Type Motors; Cools and Dehumidifies; Handles Chemicals, Foodstuffs; Valve for 125-Lb Steam; Pneumatic Switch Is Compact; Air Infiltration Thermostat; For the Dry-Kiln Operator.

No. 8. August, 1932. *p.* 587.

Friction in Regulator Minimized; Bucket Trap Action Improved; Keeps Out Noise, Conditions Air; Three Motors Developed; Controls–Injection of Chemicals; A Blowpipe; An Extensometer; Filter Employs Felt Glove; Cools Railway Cars; Heating Field Uses Molded Knobs; V-Groove Steel Pulleys; For Pressure Relief; Tapered Spindle in Trap; To Filter Air.

No. 9. September, 1932. *p.* 622.

Two-Ply Steel Announced; Pump Is Self-Priming; Valves Control Temperature; Gasket Resists Oil; Valves for Close Control; Die-Head Is Automatic; Flow Meter for Many Uses; Easy-to-Install Superheater; Bonnet Assembly for Radiators; A Ball-Swivel Pipe Hanger; Heater for Oil Tanks; Air and Control Valve; Valve Disc Rotates; New Supervisory Control; Supply Process Steam; Units Are Gas-Fired; Controls Liquid Temperature; Hot-Water Relief Valve; Feeder Easy to Install; Fans Have Safety Guards; Conceals Screw Heads; Regulates Furnace Draft; A Built-in Fin-Type Heater; Exhauster of Stoneware; Switches Have Thermal Overload Relays.

No. 10. October, 1932. *p.* 682.

New Mechanical Flow Meters; New Finned Pipe; Pump Handles Large Volumes; For Checking Temperatures; Isolates Vibration; Industrial Switch Line Completed; Registers Control Air Flow; Announces New Welding Rods; Control Has Commutator-Type Contacts; Indicating-Type Flow Meter; Line-Starters Are Explosion Resisting; New Vacuum Valve; Controls Humidity.

No. 11. November, 1932. *p.* 746.

Pumps Handle Chemical Solutions; New Method of Packing Expansion Joint; Fin-Type Convectors of Cast Iron; New Fluid Meters Announced; High-Water Alarm for Tanks; Equalizes Hot-Water Systems; Underfeed Stoker of Ram-Type; Railway-Car Precooler Announced; Turbine Drives Fans, Pumps; New Unit Cools or Heats; Tests Show Performance of Vacuum Pump; New Motor-Pump Unit; Sensitive Thermo-Regulator; Dry-Type Filters Have Many Uses; Press-Brake of Welded Construction.

No. 12. December, 1932. *p.* 801.

Vapor-Turbine-Driven Heating Pump; Cools Water with Steam; New Valves for Temperature Control; Cleans Heating Boilers; Generates Process Steam; For Accurate Humidity Control; Humidifier Nozzle Cleans Self; Compensator Features Oil-Relief Valve; New Trailer-Type Welder; Motor Is Splash Proof; Float Traps for Risers, Small Mains; New Pumping Units; Solenoid Water Valves Saves Current; Welder Has Dual Control.

Book Reviews

Publishes Book on Calculating Heat Transmission.
No. 9. September, 1932. *p.* 622.
Review of "The Calculation of Heat Transmission" by Margaret Fishenden and Owen A. Saunders; contents.

District Heating Book Issued.
No. 8. August, 1932. *p.* 556.
Contents of "Handbook of the *National District Heating Association.*"

Methods for Sampling Steam and Condensate in Corrosion Studies.
No. 7. July, 1932. *p.* 486.
Causes of pipe corrosion; booklet on sampling steam and condensate for corrosion studies published by *National District Heating Association* committee.

A Half-Century of District Steam Service Described.
No. 7. July, 1932. *p.* 486.
New York Steam Corp. publishes book commemorating fiftieth anniversary.

Bridgman's Book on High Pressure Reviewed, by F. E. Wertheim.
No. 4. April, 1932. *p.* 274.
Review of "The Physics of High Pressure," by P. W. Bridgman; scope and contents.

Effect of Temperature on Metals Subject of Symposium.
No. 4. April, 1932. *p.* 260.
"Symposium on Effect of Temperature on Metals" published by *A. S. M. E.* and *A. S. T. M.*; purpose and scope.

Symposium on Welding Published.
No. 3. March, 1932. *p.* 179.
American Society for Testing Materials publishes "Symposium on Welding"; papers included.

Text on Refrigeration Published.
No. 9. September, 1932. *p.* 620.
Contents of third edition "Principles of Refrigeration" by W. H. Motz; adopted for study by *National Association of Practical Refrigerating Engineers.*

"Refrigerating Data Book" Published.
No. 7. July, 1932. *p.* 492.
Contents and price of refrigerating data book published by *American Society of Refrigerating Engineers.*

New German Book on Drying.
No. 11. November, 1932. *p.* 737.
"Die Trockentechnik" reviewed by Malcolm Tomlinson.

Bulletin on Air Flow Through Orifices.
No. 7. July, 1932. *p.* 477.
Investigation to verify and extend range of existing data on air flow through square-edged circular orifices in thin plates at *University of Illinois*; bulletin gives results.

A. S. T. M. Proceedings Published.
No. 2. February, 1932. *p.* 99.
Review of Proceedings of *American Society for Testing Materials*, 1931.

English-German-French Dictionaries Published.
No. 5. May, 1932. *p.* 345.
Hoyer-Kreuter Technical Dictionary.

Handbook on Gas Heating Issued.
No. 5. May, 1932. *p.* 345.
New Jersey Gas Association issues handbook.

Tests of Joints in Plates Reported.
No. 5. May, 1932. *p.* 345.
Several types of joints in wide plates used in construction of tanks for water and oil storage tested; results reported in *University of Illinois* bulletin.

New Book on Industrial Temperature and Humidity Control.
No. 12. December, 1932. *p.* 796.
Contents of "The Handbook of Industrial Temperature and Humidity Control," by M. F. Behar.

Industrial Management Described.
No. 12. December, 1932. *p.* 797.
Review of "Industrial Management in this Machine Age," by Francis A. Westbrook.

Text on Automatic Refrigeration Control.
No. 12. December, 1932. *p.* 797.
Review and contents of "The Automatic Control of Refrigeration," by H. T. Lange and A. B. Schellenberg.

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